

AMENDMENT TO CLAIMS:

1. (Cancelled)

2. (Cancelled)

3. (Currently Amended) A method for increasing the specific activity of an E1 endoglucanase containing a glycosyl hydrolase site to form a mutated glycosyl hydrolase for use on a cellulose substrate relative to an unmutated form of the glycosyl hydrolase site, comprising: replacing an active site glycosyl-stabilizing amino acid of the hydrolase with an amino acid, ~~the replacing amino acid binding that binds~~ cellobiose less tightly than the glycosyl-stabilizing amino acid to provide a mutant glycosyl hydrolase, said glycosyl-stabilizing amino acid is selected from the group consisting of tryptophan, phenylalanine, and tyrosine, ~~and tyrosine~~ and said replacing amino acid is selected from the group consisting of alanine, valine, serine, glutamic acid, arginine and glycine; wherein said active or mutant site is selected from tryptophan 30, 39, 171, 181, 212 and 259; phenylalanine 229 and 258; and tyrosine 245.

4. (Cancelled)

5. (Cancelled)

6. (Cancelled)

7. (Currently Amended) The method of claim-3, wherein the mutant glycosyl hydrolase is selected from the group consisting of:

GCGGGGCGCGGGCTATTGGCACACGAGCGGGCGGGAGATCCTGGACGGCAACAACGT
GCGGGTACGGATCGCGGGCATCAACTGGTTTGGGTTCGAAACCTGCAATTACGTCGT
GCACGGTCTCTGGTCACGCGACTACCGCAGCATGCTCGACCAGATAAAGTCGGCTGGG
CTACAACACAATCCGGCTGCCGTA CTCTGACGACATTCTCAAGCGGGGCACCATGCC

GAACAGGATCAATTTTACCAGATGAATCAGGACCTGCAGGGTCTGACGTCCTTGCA
GGTCATGGACAAAATCGTCGGCTACGCCGGTCAGATCGGGCTGCGCATCATTCCTTGA
CCGCCACCGACCGGATTGCAGCGGGCAGTCCGGCGCTGTGGTACACGAGGAGCGTCT
CGGAGGCTACGTGGATTTCCGACCTGCAAGCGCTGGCGCAGCGCTAGAAGGGAAAG
CCGACGGTCGTCCGGCTTTGACTTGCACAACGAGCCGCATGACCCGGCGCTGCTGGGGG
TGGGGCGATCGGAGCATCGACTGGCGATTGGCGCGCCGAGCGGGCCGGAACGCCCGT
GCTCTCGGTGAATCGGAACCTGCTCATTTTCTCGAAGGTGTGCAGAGCTACAACGG
AGACTCCTACTGGTGGGGCGGCAACCTGCAAGGAGCGCGCCAGTACCCGGTCCGTGG
TGAACGTGCCGAACCGCCTGGTGTACTCGGGCGACGACTACGCGACGAGCGTCGGG
CCGCAGACGTGGTTACGCGATCCGACCTTCCCGAAGAAAGATGCCCGGCATCTGGAAC
AAGAAGTGGGGATACCTCTTCAATCAGAAAGATTGGACCGGTATGGCTGGGGGAATTG
GGTACGACACTGCAATCCACGACCGACGAGACGTGGCTGAAGACGCTCGTCCAGTA
CCTACGGCCGACCGCGCAATACGGTGGGGACAGCTTCCAGTGGACCTTCTCGTCCGTG
GAACCCCGATTCCGGCGACACAGGAGGAATTCTCAAGGATGACTGGGAGACGGTCCG
ACACAGTAAAAGACGGCTATCTCGCGCGGATCAAGTCGTCCGATTTTCGATCCTGTCT
AATGAATCGCCTAGCAGTCAACCGTCCCGGTGGGTGTCGCCGTCTCCGTCCCGGAGC
CCGTCCGGGAGTCCGACGGCGGACCCCTACTCCGACGCGGACAGCCAGCCCGAGCGG
AACCGTGACCCCTACTGCTACGGCCACGCCCCACGGCAAGCCCGACGCGGTACCGGA
CGGCAGCCTCCGGAGCCCGCTGCACCGCGAGTTACCAGGTCAACAGCGATTGGGGG
AAT,

GGGGGGGGGGCTATTGGCAGAGAGCGGGGGGAGATCCTGGACGGGAACAACGT
GGGGGTACGGATCGCCGGCATCAACTGGTTTGGGTTGGAACCTGCAATTACGTCTG
GCACGGTCTCCGGTCACGGGACTACCGCAGCATGCTCGACCAGATAAAGTCGGCTCG
GCTAGAAGACAATCGGGCTGGCGTACTCTCAGGACATTCTGAAGCCGGGCAACATGC
CGAACAGCATCAATTTTACCAGATGAATCAGGACCTGCAGGGTCTGACGTCTTTGC
AGGTCATGGACAAAATCGTCGGGTACGGCGGTGAGATCGGCCTGGCGATCATTCTTG
ACCGCCACCGACCGGATTGGAGCGGGCAGTCGGCGCTGTGGTACAGGAGCAGCGTG
TCGGAGGGCTACGTGGATTTCGACCTGCAAGCGCTGGGCGAGCGCTACAAGGGAAA
CCCGACGGTCTGCGGCTTTGACTTGCACAACGAGCGCGCATGACCGGGCCTGCTGGGG
CTGGGGGGATCCGAGCATCGACTGGCGATTGGCGGGCGAGCGGGGGGAAACCGCG
TGCTCTCGGTGAATCCGAACCTGCTCATTTCGTGGAAGGTGTGCAGAGCTACAACG
GAGACTGCTACTGGTGGGGCGGCAACCTGCAAGGAGCGCGCCAGTACCCGGTCTGTG
CTGAACGTGCGGAACCGCCTGGTGTACTCGGCGCAGGACTACGCGACGAGCGTCTA
CGCGCAGACGTGGTTCAGCGATCCGACCTTCGGCAACAACATGCCCGGGCATCTGGAA
CAAGAACTGGGGATACCTCTTCAATCAGAACATTGCACCGGTATGGCTGGGCGAATT
GGGTACGACACTGCAATCCACGACCGACGAGCGTGGCTGAAGACGGCTCGTCCAGT
ACCTACGGCCGACCGGGCAATACGGTGGCGACAGCTTCAGTGGACCTTCTGGTCTT
GGAACCCCGATTCCGGCGACAGAGGGAATTCTCAAGGATGACTGGCAGACGGTC
GACAGAGTAAAAGACGGCTATCTCGCGCGGATCAAGTCGTGGATTTCGATCCGTGTC
TAATGAATCGCCTAGCAGTCAACCGTCCCCGTGGGTGTGCGCGTCTCCGTGCGCGAG
CCCGTGGGGGAGTGGGACGCGGACGGCTACTCGGACGGCGACAGCCAGCGCGAGCG
CAACGGTGAACCCCTACTGCTACGCCCACGCCCAGGGCAAGCCCGACGCGGTACCG
ACGGCAGGCTCCGGAGCGCGCTGCACCGCGAGTTACCAAGGTCAACAGCGATTGGGG

CAATGGCTTCACGGTAACGGTGGCCGTGACAAATTCCG, and

ACGGGGGGGGGGCTATTGGGACAGAGCGGGCCGGAGATCCTGGACCGGAACAACGT
CCCCGTACGGATCGGGGGGATGAACCTGGTTTGGGTTGGAACCTGCAATTACGTCTGT
GCACGGTCTCTGGTGACGGGACTACGGCAGCATGCTCGACCAGATAAAGTCGCTCGG
GTACAACACAATCGGGCTGCCGTACTCTGACGACATTCTCAAGCCGGGGACCATGGC
GAACAGCATCAATTTTCGGCAGATGAATCAGGACCTGCAGGGTCTGACGTCTTGA
GGTCATGGACAAATCGTCGGGTACGGCCGGTCAGATCGGGCTGCGCATCATTCTTGA
CGGCCACCGACCGGATTGCAAGCGGGCAGTCGGCGCTGTGGTACAGGAGCAGGGTCT
GGGAGGCTACGTGGATTTCGACCTGCAAGCGCTGGCGCAGGGCTACAAGGGAAAC
CCGACGGTGGTGGGCTTTGACTTGCACAACGAGCCGCATGACCCGGGCTGGTGGGGC
TGCGGGCGATCCGAGCATCGACTGGCGATTGGCCCGCCGAGCGGGCCGGAAACGGCCGT
GCTCTGGGTGAATCCGAACCTGGTCAATTTTCGTGGAAGGTGTGCAGAGCTACAACGG
AGACTGCTACTGGTGGGGGGGCAACCTGCAAGGAGCCGGCCACTACCCGGTGGTGG
TGAACGTGGCGAAACGGGCTGGTGTACTCGGCGCAGACTACGCGACGAGCGTCTAC
CCGCAGAGGTGGTTACGGATCCGACCTTCCCCAACAACATGCCCGGCATCTGGAAC
AAGAAGTGGGGATACCTCTTCAATCAGAACATTGCACCGGTATGGCTGGGCGAATTC
GGTACGACACTGCAATCCACGAGCGAGCAGAGGTGGCTGAAGACGCTGGTCCAGTA
GCTACGGGCGGACCGGGCAATACGGTGGGGACAGCTTCCAGTGGACCTTCTGGTGGTG
GAACCCCGATTCCGGCGACACAGGAGGAATTCTCAAGGATGACTGGCAGACGGTGG
AGACAGTAAAAGACGGGTATCTCGGGCGGATCAAGTCGTGATTTTCGATGCTGTCT
AATGAATCGGCTAGCAGTCAACCGTCCCGGTGGGTGTGGCGGTCTCGGTGGCCGAGC
CCGTGGGGGAGTGGGACGGCCGACGGCTACTCCGACGGCGACAGCCAGCCCGACGGC

~~AACGCTGACCCCTACTGCTACGCCACGCCACGCCAAGCCCGACGCCGTCACCGA~~
~~CGGCAGCCTCCGGAGCCCGCTGCACCCGAGTTACCAGGTCAACAGCGATTGGGGG~~
~~AATGGCTTCACGGTAACGGTGGCCGTGACAAATTCCG~~

AGGGYWHTSG	REILDANNVP	VRIAGINWFG	FETCNVYVHG	LWSRDYRSM	DQIKSLGYNT	60
IRLPYSDDIL	KPGTMPNSIN	FYQMNQDLQ	LTSLQVMDKI	VAYAGQIGLR	IILDRHRPDC	120
SGQSALWYTS	SVSEATWISD	LQALAORYKG	NPTVVGFDLH	NEPHDPACWG	CGDPSIDWRL	180
AAERAGNAVL	SVNPNLLIFV	EGVQSYNGDS	YWWGGNLQGA	GQYPVVLNVP	NRLVYSAHDY	240
ATSVGPQTWF	SDPTFPNNMP	GIWNKNWGYL	FNQNIAPVWL	GEFGTTLQST	TDQTLWKTLY	300
QYLRPTAQYG	ADSFQWTFWS	WNPDSGDTGG	ILKDDWQTV	TVKDGYLAPI	KSSIFDPV	358

SEQ ID NO. 2;

AGGGYWHTSG	REILDANNVP	VRIAGINWFG	FETCNVYVHG	L SRDYRSM	DQIKSLGYNT	60
IRLPYSDDIL	KPGTMPNSIN	FYQMNQDLQ	LTSLQVMDKI	V AYAGQIGLR	IILDRHRPDC	120
SGQSALWYTS	SVSEATWISD	LQALAORYKG	NPTVVGFDLH	NEPHDPACWG	CGDPSIDWRL	180
AAERAGNAVL	SVNPNLLIFV	EGVQSYNGDS	YWWGGNLQGA	GQYPVVLNVP	NRLVYSAHDY	240
ATSVYPQTWF	SDPTFPNNMP	GIWNKNWGYL	FNQNIAPVWL	GEFGTTLQST	TDQTLWKTLY	300
QYLRPTAQYG	ADSFQWTFWS	WNPDSGDTGG	ILKDDWQTV	TVKDGYLAPI	KSSIFDPV	358

SEQ ID NO. 3;

and

AGGGYWHTSG	REILDANNVP	VRIAGINWFG	FETCNVYVHG	LWSRDYRSM	DQIKSLGYNT	60
IRLPYSDDIL	KPGTMPNSIN	FR OMNQDLQ	LTSLQVMDKI	VAYAGQIGLR	IILDRHRPDC	120
SGQSALWYTS	SVSEATWISD	LQALAORYKG	NPTVVGFDLH	NEPHDPACWG	CGDPSIDWRL	180
AAERAGNAVL	SVNPNLLIFV	EGVQSYNGDS	YWWGGNLQGA	GQYPVVLNVP	NRLVYSAHDY	240
ATSVYPQTWF	SDPTFPNNMP	GIWNKNWGYL	FNQNIAPVWL	GEFGTTLQST	TDQTLWKTLY	300
QYLRPTAQYG	ADSFQWTFWS	WNPDSGDTGG	ILKDDWQTV	TVKDGYLAPI	KSSIFDPV	358

SEQ ID NO. 4 ; or a mixture thereof.

8. (Cancelled)
9. (Cancelled)
10. (Cancelled)
11. (Cancelled).
12. (Cancelled)
13. (Cancelled)
14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)

21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Cancelled)

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Currently Amended) A method for increasing the specific activity of

Acidothermus cellulolyticus of E1 endoglucanase containing a glycosyl hydrolase site to form a mutated glycosyl hydrolase for use on a biomass substrate, comprising replacing, by site-directed-mutagenesis, an active site associated glycosyl-stabilizing amino acid of the E1 endoglucanase with an amino acid, ~~the replacing amino acid binding that binds~~ cellobiose less tightly than the glycosyl-stabilizing amino acid to provide a mutant E1 endoglucanase; said glycosyl-stabilizing amino acid is selected from the group consisting of tryptophan, phenylalanine and tyrosine, and the replacing amino acid is selected from the group consisting of alanine, valine, serine, glutamic acid, arginine and glycine; wherein said active or mutant site is

selected from tryptophan 30, 39, 171, 181, 212 and 259; phenylalanine 229 and 258; and tyrosine 245.

30. (Cancelled)

31. (Currently Amended) The method of claim 29, wherein the mutant endoglucanase is selected from the group consisting of:

GCGGGCGGCGGCTATTGGCACACGAGCGGGCGGAGATCCTGGACGGCGAACAAGGT
GGCGGTACGGATCGCCGGCATCAACTGGTTTGGGTTGGAACCTGCAATTACGTCGT
GCACGGTCTCTGGTCACGCGACTACCGCAGCATGCTCGACCAGATAAAGTCGCTCGG
CTAGAAGACAATCCGGCTGGCGTACTCTGACGACATTCTCAAGCCGGGGACCATGGC
GAACAGCATCAATTTTACCAGATGAATCAGGACCTGCAGGGTCTGACGTCCTTGCA
GGTCATGGACAAAATCGTGGCGTACGCGGGTCAGATCGGCGCTGGCGCATGATTCTGA
CCGCCACCGACCGGAATTGCAGCGGGCAGTCGGGGCTGTGGTACACGAGCAGCGTCT
GGGAGGCTACCTGGATTTCGACCTGCAAGGGCTGGGGGAGCGGTACAAGGGAAAG
CCGACGGTCGTGGGCTTTGACTTGCACAACGAGCCGCATGACCCGGGCTGCTGGGGG
TGGGGCGATCCGAGCATCGACTGGCGATTGGCGGGCGAGCGGGCCGGAAACGCCCGT
GCTCTCGGTGAATCCGAACCTGCTCATTTTCTCGAAGGTGTGCAGAGCTACAACGG
AGACTCCTACTGGTGGGGCGGGCAACCTGCAAGGAGCCGGCCAGTACCCGGTCGTGC
TGAACGTGCGGAACCGGCTGGTGTACTCGGGCCACGACTACCGGACGAGCGTCGGG
CCGCAGACGTGGTTGAGCGATCCGACCTTCCCGAACAACATGCCCGGGCATCTGGAAC
AAGAACTGGGGATACCTCTTCAATCAGAACATTGCACCGGTATGGCTGGGGGAATTC
GGTACGACACTGCAATCCACGACCGACGAGACGTGGCTGAAGACGCTCGTCCAGTA
GCTACGGCCGACCGCGCAATACGGTGGCGACAGCTTCCAGTGGACCTTCTGGTCCTG
GAACCCCGATTCCGGCGACACAGGAGGAATTCTCAAGGATGACTGGCAGACGGTCC

ACACAGTAAAAGACGGCTATCTCGCGCCGATCAAGTCGTGGATTTCGATCCTGTCT
AATGAATCGCCTAGCAGTCAACCGTCCCCGTGGGTGTGCGCGTCTCCGTGCGCGAAG
CCGTGCGCGAGTCGGACGCGGACGGCTACTCCGACGCGGACAGCCAGCCCGACGGC
AAGGCTGACCGCTACTGCTACGCCCCACGCCCCACGGCAAGCCCCAGCGCGCTCAGCGA
CGGCAGCGCTCGCGAGCGCGGTGCLCGCGGAGTTACCAAGTCAACAGCGATTGGGGG
AAT,

GCGGGCGCGCGCTATTGGCAGACGAGCGGCGGGAGATCCTGGACGCGAACAACGT
GCGGGTACGGATCGCCGGCATCAACTGGTTTGGGTTCGAAACCTGCAATTACGTCTT
GCACGGTCTCGCGTCACGCGACTACGCGACCATGCTCGACCAGATAAAGTCGCTCG
GCTACAACACAATCCGGCTGCGGTACTCTGAGGACATTCTCAAGCGCGGGACCATGC
CGAACAGCATCAATTTTACCAGATGAATCAGGACCTGCAGGGTCTGACGTCTTGC
AGGTCATGGACAAAATCGTCCCGTACCCCGGTGAGATCGGCGCTCGGCATCATTCTTG
ACGCGGACCGACCGGATTGACGCGGGCAGTCGGCGGTGTGGTACAGGAGCAGCGTG
TCGCAGCGTACCTGGATTTCGCGACCTGCAAGCGCTGCGCGCAGCGCTACAAGCGAAA
CCCGACGGTCGTGCGCTTTGACTTGAGACAACGAGCCGCATGACCCGGCGCTGCTGGGG
CTGCGGCGATCCGAGCATCGACTGGCGATTGGCCGCGGAGCGGGCGGGAAACGCGG
TGCTCTCGGTGAATCCGAACCTGCTCATTTCGTGGAAGGTGTGCAGAGCTACAAGG
GAGACTCCTACTGGTGGGGCGGCAACCTGCAAGGAGCCGGCCAGTACCCGGTCTGTG
CTGAACGTGCGGAACCGCGCTGGTGTACTCGGCGGACGACTACGCGACGAGCGCTTA
CGCGCAGACGTGGTTGAGCGATCCGACCTTCGCGAACAACATGCCCGGGATCTGGAA
CAAGAACTCGCGATACCTCTTCAATCAGAACATTGCACCGGTATGGCTGGGCGAATT
CGGTACGAGACTGCAATCCAGGACCGACGAGCGTGGCTGAAGACCGCTCGTCCAGT

ACCTACGGCCGACCCCGGAATACGGTGGGGACAGCTTCAGTGGACGTTCTGGTCT
GGAACCCCGATTCCGGCGACACAGGAGGAATTCTCAAGGATGACTGGCAGACGGTG
GACACAGTAAAAGACGGGTATCTCGCGCCGATCAAGTCGTGATTTTCGATCCTGTG
TAATGAATCGCCTAGCAGTCAACCGTCCCGTCGGTGTGGCCCTCTCCGTGGCCGAG
CCCGTGGCCGAGTGGGACGCGGACGGCTACTCGGACGGCGACAGCCAGCCCGACCG
GAACGGTGACCCCTACTGCTACGCGCAGCGCCACGGCAAGCCCGACGCGGTACCG
ACGGCAGCCTCCGGAGCCCGCTGCAGCGCGAGTTACCAGGTCAACAGCGATTGGGG
CAATGGCTTCACGGTAACGGTGGCCGTGACAAATTCCG, and

GCGGGCGGGCGGCTATTGGCAGACGAGCGGGCGGGAGATCCTGGACGCGAACAACGT
GCGGGTACGGATCCCGGGCATCAACTGGTTTGGGTTCGAAACCTGCAATTACGTGGT
GCACGGTCTCTGGTCACCGGACTACCGCAGCATGCTCGACCAGATAAAGTCGGTCCG
CTACAACACAAATCCGGCTGCCGTACTCTGACGACATTCTCAAGCCGGGGCACCATGCC
GAACAGCATCAATTTTCGGCAGATGAATCAGGACCTGCAGGGTCTGACGTCTTGA
GGTCATGGACAAAATCGTCCCGTACGCGCGTCAGATCGGCCCTGCCCATCATTTCTGA
CCGCCACCGACCGGATTGCAGCGGGCAGTCGGCGCTGTGGTACACGAGCAGCGTCT
CGGAGGCTACGTGGATTTCGACCTGCAAGCGCTGGCGCAGCGCTACAAGGGAAAG
CGGACGGTCTGTGGCTTTGACTTGACACAACGAGCGCGCATGACCCGGCCCTGCTGGGGC
TGCGCGGATCCGAGCATCGACTGGCGATTGGCGCGCGAGCGGGCCCGGAACCGCGGT
GCTCTCGGTGAATCCGAACCTGCTCATTTTCGTGGAAGGTGTGCAGAGCTACAACGG
AGACTCCTACTGGTGGGGCGGCAACCTGCAAGGAGCGCGGCACTACCCGGTCTGTG
TGAACGTGCCGAACCGCCTGGTGTACTCGGCGCACGACTACGCGACGAGCGTCTAC
CGGCAGACGTGGTTCAGCGATCCGACCTTCCCCAACAACATGCCCGGGCATCTGGAAC

AAGAACTGGGGGATACCTCTTCAATCAGAACATTGCACCGGTATGGCTGGGGCGAATTC
 GGTACGACACTGCAATCCACGACGGGACCAGACGCTGGCTGAAGACGCTCGTCCAGTA
 CCTACGGCCCGACCGCGCAATACGGGTGCGGACAGCTTCCAGTGGACCTTCTGGTCTCTG
 GAACCCCGGATTCCGGGGGACACAGGAGGAATTCTCAAGGATGACTGGCAGACGGTCG
 ACACAGTAAAAGACGGCTATCTCGCGCCGATCAAGTCGTCGATTTTCGATCCTGTCT
 AATGAATCGCCTAGCAGTCAACCGTCCCCGTCGGTGTCGCGCTCTCCCTGGCCGAGG
 CCGTCGGCGAGTCCGACGCCGACGCCTACTCCGACGGCCGACAGCCAGCCCGACGCC
 AACGGTGACCCCTACTGCTACGCCCCACGCCCCACGGCAAGCCCGACGCCGTCACCGA
 GGGCAGGCTCCGGAGCCCGCTGCACCGCGAGTTACCAGGTCAACAGCGATTGGGGG
 AATGGCTTCACGGTAACGGGTGGCCCGTGACAAATTCGG

AGGGYWHTSG	REILDANNVP	VRIAGINWFG	FETCNYVVHG	LWSRDYRSM	DQIKSLGYNT	60
IRLPYSDDIL	KPGTMPNSIN	FYQMNQDLQ	LTSLQVMDKI	VAYAGQIGLR	IILDRHRPDC	120
SGQSALWYTS	SVSEATWISD	LQALAORYKG	NPTVVGFDLH	NEPHDPACWG	CGDPSIDWRL	180
AAERAGNAVL	SVNPNLLIFV	EGVQSYNGDS	YWWGGNLQGA	GQYPVVLNVP	NRLVYSAHDY	240
ATSVGPQTWF	SDPTFPNNMP	GIWNKNWGYL	FNQNIAPVWL	GEFGTTLQST	TDQTLWKLTV	300
QYLRPTAQYG	ADSFQWTFWS	WNPDSGDTGG	ILKDDWQTV	TVKDGYLAPI	KSSIFDPV	358

SEQ ID NO. 2;

AGGGYWHTSG	REILDANNVP	VRIAGINWFG	FETCNYVVHG	LWSRDYRSM	DQIKSLGYNT	60
IRLPYSDDIL	KPGTMPNSIN	FYQMNQDLQ	LTSLQVMDKI	VAYAGQIGLR	IILDRHRPDC	120
SGQSALWYTS	SVSEATWISD	LQALAORYKG	NPTVVGFDLH	NEPHDPACWG	CGDPSIDWRL	180
AAERAGNAVL	SVNPNLLIFV	EGVQSYNGDS	YWWGGNLQGA	GQYPVVLNVP	NRLVYSAHDY	240
ATSVGPQTWF	SDPTFPNNMP	GIWNKNWGYL	FNQNIAPVWL	GEFGTTLQST	TDQTLWKLTV	300
QYLRPTAQYG	ADSFQWTFWS	WNPDSGDTGG	ILKDDWQTV	TVKDGYLAPI	KSSIFDPV	358

SEQ ID NO. 3;

and

AGGGYWHTSG	REILDANNVP	VRIAGINWFG	FETCNYVVHG	LWSRDYRSM	DQIKSLGYNT	60
IRLPYSDDIL	KPGTMPNSIN	FROMNQDLQ	LTSLQVMDKI	VAYAGQIGLR	IILDRHRPDC	120
SGQSALWYTS	SVSEATWISD	LQALAORYKG	NPTVVGFDLH	NEPHDPACWG	CGDPSIDWRL	180
AAERAGNAVL	SVNPNLLIFV	EGVQSYNGDS	YWWGGNLQGA	GQYPVVLNVP	NRLVYSAHDY	240
ATSVGPQTWF	SDPTFPNNMP	GIWNKNWGYL	FNQNIAPVWL	GEFGTTLQST	TDQTLWKLTV	300
QYLRPTAQYG	ADSFQWTFWS	WNPDSGDTGG	ILKDDWQTV	TVKDGYLAPI	KSSIFDPV	358

SEQ ID NO. 4; or a mixture thereof.

AAGA ACTGGGGATACCTCTTCAATCAGAACATTGCACCGGTATGGCTGGGGGAATTG
 GGTACGAGACTGCAATCCACGACCGACCAAGACGCTGGCTGAAGACGCTCGTCCAGTA
 CCTACGGCGGACCGCGCAATACGGTGCGGACAGCTTCCAGTGGACCTTCTGGTCTCTG
 GAACCCCGATTCCGGCGACACAGGAGGAATTCTCAAGGATGACTGGCAGAGGGTCCG
 ACACAGTAAAAGACGGGCTATCTCGCGCCGATCAAGTCGTTCGATTTTCGATCCTGTCT
 AATGAATCGCCTAGCAGTCAACCGTCCCGGTCGGTGTCCCGCTCTCCGTCCCGGAGG
 CCGTCCCGGAGTCCGACGCGGACGCCTACTCCGACGCGGACAGCCAGGCGGACGCG
 AACGGGTGACCCCTACTGCTACGCCACGCCCCACGGCAAGCCCGACGCCGTCACCGA
 CGGCAGCCTCCGGAGCCCCGCTGCACCGCGAGTTACCAGGTCAACAGCGATTGGGGG
 AATGGCTTCACGGTAACGGTGGCCGTGACAAATTCCG

AGGGYWHTSG	REILDANNVP	VRIAGINWFG	FETCNVYVHG	LWSRDYRSM	DQIKSLGYNT	60
IRLPYSDDIL	KPGTMPNSIN	FYQMNQDLQG	LTSLOVMDKI	VAYAGQIGLR	IILDRHRPDC	120
SGQSALWYTS	SVSEATWISD	LQALAQRYKG	NPTVVGFDLH	NEPHDPACWG	CGDPSIDWRL	180
AAERAGNAVL	SVNPNLLIFV	EGVQSYNGDS	YWWGGNLQGA	GQYPVVLNVP	NRLVYSAHDY	240
ATSVGPQTFW	SDPTFPNNMP	GIWNKNWGYL	FNQNIAPVWL	GEFGTTLQST	TDQTNLKTIV	300
QYLRPTAQYG	ADSFQWTFWS	WNPDSGDTGG	ILKDDWQTV	TVKDGYLAPI	KSSIFDPV	358

SEQ ID NO. 2;

AGGGYWHTSG	REILDANNVP	VRIAGINWFG	FETCNVYVHG	LWSRDYRSM	DQIKSLGYNT	60
IRLPYSDDIL	KPGTMPNSIN	FYQMNQDLQG	LTSLOVMDKI	VAYAGQIGLR	IILDRHRPDC	120
SGQSALWYTS	SVSEATWISD	LQALAQRYKG	NPTVVGFDLH	NEPHDPACWG	CGDPSIDWRL	180
AAERAGNAVL	SVNPNLLIFV	EGVQSYNGDS	YWWGGNLQGA	GQYPVVLNVP	NRLVYSAHDY	240
ATSVGPQTFW	SDPTFPNNMP	GIWNKNWGYL	FNQNIAPVWL	GEFGTTLQST	TDQTNLKTIV	300
QYLRPTAQYG	ADSFQWTFWS	WNPDSGDTGG	ILKDDWQTV	TVKDGYLAPI	KSSIFDPV	358

SEQ ID NO. 3;

and

AGGGYWHTSG	REILDANNVP	VRIAGINWFG	FETCNVYVHG	LWSRDYRSM	DQIKSLGYNT	60
IRLPYSDDIL	KPGTMPNSIN	FYQMNQDLQG	LTSLOVMDKI	VAYAGQIGLR	IILDRHRPDC	120
SGQSALWYTS	SVSEATWISD	LQALAQRYKG	NPTVVGFDLH	NEPHDPACWG	CGDPSIDWRL	180
AAERAGNAVL	SVNPNLLIFV	EGVQSYNGDS	YWWGGNLQGA	GQYPVVLNVP	NRLVYSAHDY	240
ATSVGPQTFW	SDPTFPNNMP	GIWNKNWGYL	FNQNIAPVWL	GEFGTTLQST	TDQTNLKTIV	300
QYLRPTAQYG	ADSFQWTFWS	WNPDSGDTGG	ILKDDWQTV	TVKDGYLAPI	KSSIFDPV	358

SEQ ID NO. 4 ; or a mixture thereof.